Chapter 2
Lower Abdominal Pain/Suprapubic Pain

Paolo Gontero and Bruno Frea

Abstract The term “lower abdomen” refers to the portion of abdomen below the umbilicus in which three topographic regions can be identified: the hypogastrium in the middle and the left and right iliac fossa, both located lateral to the hypogastrium, in the left and right inferior part of the surface of the human abdomen, respectively. The majority of men and women will complain, at least once in their life, of a pain localized in the lower abdomen. For this reason, the number of GP’s referrals because of a lower abdominal pain is expected to be high. A number of different diseases can cause a pain, of variable mode of presentation, intensity, and duration, in the left iliac fossa, the right iliac fossa, and the hypogastrium (this latter also termed suprapubic pain), respectively. These may arise from different organs (bowel, lower urinary tract, and female reproductive system) and thus potentially involve different specialists (general surgeon, urologist, and gynecologist). Importantly, the physician needs to suspect those few cases that need an urgent referral, i.e., extrauterine pregnancy in fertile females and cecal or sigmoid perforation, more common in elderly patients. The aim of this chapter is to provide general criteria (essentially based on patient’s history and examination) that may lead a GP to suspect a urological origin of lower abdominal pain (and the need for a urological referral). The main features for the differential diagnosis with diseases belonging to other apparatus will also be provided in order to identify the most appropriate specialist referral.

Keywords Hypogastric pain • Suprapubic pain • Iliac fossa pain • Urine retention • Prostatitis • Appendicitis • Sigmoid diverticulosis • Adnexitis
Introduction

The term “lower abdomen” refers to the portion of abdomen below the umbilicus. Three topographic regions can be identified: the hypogastrium in the middle and the left and right iliac fossa, both located lateral to the hypogastrium, in the left and right inferior part of the surface of the human abdomen, respectively. The majority of men and women will complain, at least once in their life, of a pain localized in the lower abdomen. For this reason, the number of GP’s referrals for a lower abdominal pain is expected to be high. A number of different diseases can result in a pain, of variable mode of presentation, intensity, and duration, in the left iliac fossa, the right iliac fossa, and the hypogastrium (this latter also termed “suprapubic pain”), respectively. These may arise from different organs (bowel, lower urinary tract, and female reproductive system) and thus potentially involve different specialists (general surgeon, urologist, and gynecologist). The aim of this chapter is to provide general criteria (essentially based on patient’s history and examination) that may lead to suspicion of a urological origin for lower abdominal pain (and the need for a urological referral). The main features for the differential diagnosis with diseases belonging to other apparatus will also be provided in order to lead GPs to make the most appropriate specialist referral.

Hints to Make a Differential Diagnosis of Lower Abdominal Pain

An accurate patient history should focus on the duration and intensity of pain and whether it is a primary presentation or recurrent pain. A thorough examination is crucial to help in localizing the affected organ. It should start with abdominal palpation (looking for palpable masses or signs of peritonism) followed by digital exploration of the inguinal canal in the male and the crural canal in the female. Digital compression of the vertebral spinous processes, the paravertebral muscles, and the pubic tendon of tight adductor muscles may help to identify pain trigger points suggestive of radiculitis.

In males, digital rectal examination of the prostate helps to identify a pain of prostatic origin. In females, vaginal examination should preferably be carried out both manually and with the speculum. Digital examination of the vaginal fornices, the cervix, and the trigone (this latter palpable through the anterior vaginal wall) may help to locate the origin of the pain. Tables 2.1 and 2.2 report the main clinical situations that may present with iliac fossa and hypogastric pain, respectively.
### Table 2.1  Most common urological and non-urological diseases that may cause pain in the right or left iliac fossa

<table>
<thead>
<tr>
<th>Disease</th>
<th>Patient's history and/or symptoms</th>
<th>Examination findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ureteric calculi&lt;sup&gt;a&lt;/sup&gt;</td>
<td>History of urinary calculi, recent episode of renal colic, dysuria</td>
<td>Severe pain triggered by compression of a localized point of the iliac fossa; microscopic hematuria</td>
</tr>
<tr>
<td>Acute appendicitis (right iliac fossa)</td>
<td>Nausea, low-grade fever, history of pain beginning in the periumbilical region and migrating to the right lower quadrant</td>
<td>Right lower quadrant tender during palpation; rebound tenderness, Rovsing's sign (pain in right lower quadrant with palpation of left lower quadrant)</td>
</tr>
<tr>
<td>Inguinal hernia</td>
<td>Male, pain exacerbated with standing position, strain, or heavy lifting</td>
<td>Herniation of bowel detectable by digital exploration of the inguinal canal</td>
</tr>
<tr>
<td>Sigmoid diverticulosis (left iliac fossa)</td>
<td>Elderly, irregular bowel habits, recurrent colicky pain</td>
<td>Localized tenderness in either the left or right iliac fossa, palpable mass, abdominal guarding, fever</td>
</tr>
<tr>
<td>Cecal perforation (right iliac fossa)</td>
<td>Absence of period or known pregnancy</td>
<td>Peritonism, signs of shock, positive pregnancy test</td>
</tr>
<tr>
<td>Extrauterine pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertebral ovarian pain (ovulation, bleeding, torsion, or rupture of ovarian cyst)</td>
<td>Ovulation, known ovarian cystic disease</td>
<td>Painful palpation of vaginal fornices</td>
</tr>
<tr>
<td>Pain referable to a vertebral radiculitis</td>
<td>Pain occurred after an abrupt movement, known vertebral disease</td>
<td>Pain exacerbated by digital compression of the spinous vertebral processes</td>
</tr>
</tbody>
</table>

<sup>a</sup> Occasionally, a calculus that has migrated to the distal portion of the ureter can lead to a severe pain exclusively radiated to the corresponding iliac fossa (in the absence of an accompanying loin/flank pain)

<sup>b</sup>A worsening of the pain following digital compression in the area of the iliac fossa where the ureter crosses the iliac vessels (usually corresponding to the midpoint of a line between the umbilicus and the anterior superior iliac spine) may suggest a ureteral stone
Table 2.2 Most common urological and non-urological diseases that may present with a suprapubic pain

<table>
<thead>
<tr>
<th>Disease</th>
<th>Patient’s history and/or symptoms</th>
<th>Examination findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute or chronic urine retention*</td>
<td>Long-standing lower urinary tract symptoms, severe pain, oliguria, or anuria</td>
<td>Palpable suprapubic mass</td>
</tr>
<tr>
<td>Acute or chronic prostatitis</td>
<td>Dysuria, urinary frequency, fever in the acute phase. Urinary symptoms can be mild or absent in the chronic phase</td>
<td>Painful, swollen, and hot prostate in the acute phase. Digital rectal examination can be unremarkable in chronic prostatitis</td>
</tr>
<tr>
<td>Acute cystitis</td>
<td>Dysuria, urinary frequency</td>
<td>Examination of the anterior vaginal wall can be painful, leukocytes and/or nitrates on urine dipstick</td>
</tr>
<tr>
<td>Pelvic inflammatory disease</td>
<td>Young women, unprotected sexual intercourse</td>
<td>Cervical pain on palpation</td>
</tr>
<tr>
<td>Endometriosis</td>
<td>Young women, pain exacerbated during period</td>
<td>Cervical pain on palpation</td>
</tr>
<tr>
<td>Osteitis pubis</td>
<td>History of inguinal hernia repair or pelvic surgery, athletes, pregnancy</td>
<td>Pressure on the pubic tubercle exacerbates the pain</td>
</tr>
<tr>
<td>Irritable bowel disease</td>
<td>Long-term history of intermittent, migrating abdominal pain, anxious temperament, irregular bowel habits</td>
<td>Abdomen thoroughly tender upon examination</td>
</tr>
</tbody>
</table>

*Acute urine retention may occasionally occur in totally asymptomatic patients as a result of a sudden blockage of the urine output due to blood clots or acute prostatitis, although in the majority of cases it represents a complication of an obstructive prostate in patients with lower urinary tract symptoms. Acute urinary retention usually presents in patients with normal or reduced bladder compliance; hence, the patient usually experiences severe hypogastric pain for urine volumes minimally exceeding the normal bladder capacity of 300–400 ml. On the contrary, chronic urinary retention occurs in bladders that have lost their compliance because of a long-standing history of voiding symptoms with high urine residual volumes. The patient usually presents with an enlarged bladder with high urine volume (even 2,000 ml) in spite of only low or moderate discomfort. Overflow incontinence is a frequently associated symptom that describes severe urinary urgency and frequency followed by the emission of only a small amount of urine without resolution of the chronic retention.

Algorithm for Managing Hypogastric and Iliac Fossa Pain in the GP’s Office

These flowcharts aim to provide the GP with simple suggestions to guide the sometimes difficult decision-making in choosing the most appropriate specialist for referring a patient with hypogastric pain, also referred as “suprapubic pain” (Flowchart 2.1), and iliac fossa pain (Flowchart 2.2).
Hypogastric pain/suprapubic pain

Male (1)

- No urinary symptoms
  - Bowel disease
  - Vascular disease
  - General surgeon referral

- Presence of dysuria and voiding dysfunction (3)
  - Prostatitis
  - Cystitis
  - Urinary retention
  - Urine culture
  - Suprapubic USS
  - Catheterization
  - Consider urological referral

- Pain at the cervix or vaginal fornices (7)
  - Cystitis
  - Extrinsic bladder compression (urine retention)
  - Urine culture
  - Pelvic ultrasound
  - Catheterization
  - Consider gynecological referral

Female (4)

- Dysuria and voiding dysfunction (5)
  - Cystitis
  - Extrinsic bladder compression (urine retention)
  - Urine culture
  - Suprapubic USS
  - Catheterization
  - Consider urological referral

- No urinary symptoms (6)
- Pain at the cervix or vaginal fornices (7)
  - Cystitis
  - Extrinsic bladder compression (urine retention)
  - Urine culture
  - Pelvic ultrasound
  - Catheterization
  - Consider gynecological referral

- No urinary symptoms (6)

Consider general surgery/gastroenterological referral

Consider speciality referral as appropriate
1. Diseases causing hypogastric pain/suprapubic pain in a male patient differ in type and frequency of presentation from those affecting a female patient.
2. Absence of associated urinary symptoms should prompt the GP to consider a bowel disease as the most likely explanation of the symptom. In young patients, a history of recurrent and migrating abdominal discomfort, bloating, and modification of bowel habits with alternation of diarrhea and constipation can suggest an irritable bowel syndrome. In patients with vascular risk factors and/or comorbidity, acute hypogastric pain may be the result of dissection of an arterial iliac aneurysm or bowel infarction. If any of these latter conditions are suspected, a referral to an emergency department is mandatory.
3. When hypogastric pain is associated with urinary symptoms, urinary retention must always be ruled out, particularly in elderly patients whose frail mental condition sometimes makes it difficult to interpret their symptoms. The finding of a suprapubic mass during examination of the hypogastrium warrants catheterization to rule out urine retention even if urinary symptoms are mild. When available, suprapubic ultrasound is a simple and noninvasive method to rule out the presence of urine retention. A distended bladder due to chronic urine retention may contain up to 2–3l of urine. In this case, it is mandatory to monitor the patient’s urine output for at least 24 hours following catheterization because of the risk of severe polyuria.
   Cystitis or bladder stones are usually accompanied by burning while urinating and urinary frequency. However, the most common cause of suprapubic/hypogastric pain in young and adult males is prostatitis. Urinary symptoms (dysuria and/or frequency and/or urgency), while common, can also be absent.
4. The spectrum of diseases causing hypogastric pain in females differs substantially from that of males.
5. The presence of urinary symptoms such as dysuria, frequency, and urgency is highly suggestive of cystitis. In the case of bacterial cystitis, the urine dipstick is usually positive for leukocytes and/or nitrates, whilst urine culture shows significant growth of a bacterial strain. Antibiotics are usually effective in relieving symptoms and clearing urine. Failure to respond to antibiotic course and/or negative urine culture may indicate so-called “abacterial” cystitis or urethral syndrome. It is important in such cases to rule out the possibility of an extrinsic bladder compression from a pelvic mass or a bladder tumor. Urine retention is far less frequent in females and should prompt the suspicion of a pelvic prolapse or a neoplastic mass (e.g., carcinoma of the cervix).

6. When hypogastric pain is not accompanied by urinary symptoms, the patient’s history and examination should aim to look for hints that may help in the differential diagnosis between gynecological and gastroenterological disorders.

7. A careful vaginal exploration may help to suspect a pelvic inflammatory disease in case of tenderness localized at the level of vaginal fornices. An inflammatory process localized to the womb (endometriosis, cervicitis, etc.) has to be suspected when the uterine cervix is painful upon palpation.

8. A lower abdominal pain that is worsened by palpation along with a negative pelvic examination suggests inflammatory bowel diseases. Referral to a general surgeon or gastroenterologist may be appropriate.

Comments About Flowchart 2.2

9. In the differential diagnosis of a right-sided iliac fossa pain, it is important to consider the patient’s age and sex.

10. In a fertile female, pregnancy should always be ruled out, particularly in the presence of delayed period, by carrying out a pregnancy test (easily feasible in the office using pregnancy test strips). It should always be kept in mind that a pain in either the two iliac fossae can be the presenting symptom of an extrauterine pregnancy. After pregnancy has been excluded, the following clinical conditions should be considered as the most likely: appendicitis (signs of peritonism helps in the diagnosis), adnexitis (an inflammatory disease affecting the fallopian tubes and ovaries: vaginal exploration is usually painful), and ureteric colic.

11. In young or adult men, ureteric colic and appendicitis are the most likely clinical conditions to included the differential diagnosis.

12. In elderly patients, while appendicitis is always possible, a cecal perforation secondary to a tumor needs to be taken into consideration. A differential diagnosis among these two diseases may be extremely difficult due to overlapping signs. Often, mild symptoms with a palpable mass may simply be due to constipation. Ureteral stones are always possible but less probable than in younger men.

13. When assessing a left-sided iliac fossa pain, it is important to exclude the possibility of sigmoid diverticulitis, not an uncommon situation in elderly patients of both sexes. Sigmoid diverticula are highly prevalent in the elderly and can occasionally undergo inflammation or even perforation resulting in left lower quadrant pain, fever, and the feeling of a palpable mass. Younger adult diseases causing left iliac fossa pain include adnexitis and ectopic pregnancy in females and ureteric colic in both sexes.
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